

# Starting Smart with Oracle Advanced Analytics

Great Lakes Oracle Conference

Tim Vlamis

Thursday, May 19, 2016

# VlamiS Software Solutions

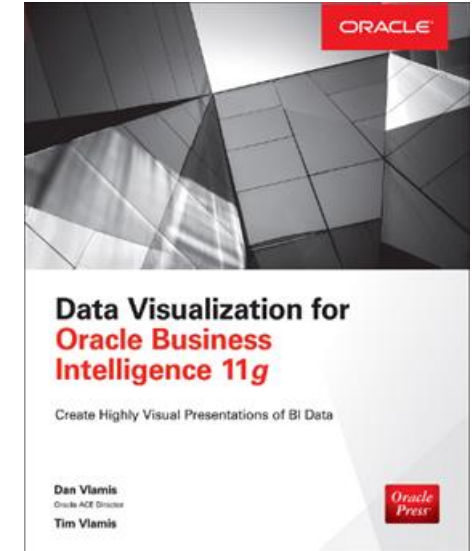
- VlamiS Software founded in 1992 in Kansas City, Missouri
- Developed 200+ Oracle BI and analytics systems
- Specializes in Oracle-based:
  - Enterprise Business Intelligence & Analytics
  - Analytic Warehousing
  - Data Mining and Predictive Analytics
  - Data Visualization
- Multiple Oracle ACEs, consultants average 15+ years
- [www.vlamiS.com](http://www.vlamiS.com) (blog, papers, newsletters, services)
- Co-authors of book “Data Visualization for OBI 11g”
- Co-author of book “Oracle Essbase & Oracle OLAP”
- Oracle University Partner
- Oracle Gold Partner

 EDUCATION RESELLER

 APPROVED  
EDUCATION CENTER


 Gold  
Partner

Specialized  
Oracle Business Intelligence  
Foundation Suite 11g





## Vice President & Analytics Strategist

- 30+ years in business modeling and valuation, forecasting, and scenario analyses
- Oracle ACE  ORACLE ACE
- Instructor for Oracle University's Predictive Analytics, Data Mining Techniques and Oracle R Enterprise Essentials Courses
- Professional Certified Marketer (PCM) from AMA
- Adjunct Professor of Business Benedictine College
- MBA Kellogg School of Management (Northwestern University)
- BA Economics Yale University



# Presentation Agenda

- Background on Analytic Options to the Oracle DB
- Oracle Advanced Analytics
  - Oracle Data Mining
  - Oracle R Enterprise
- How to start with OAA – comparison of options



# Spectrum of Oracle DB Analytics

## OLAP

Summaries,  
hierarchies and  
dimensional data

*“Analysis”*

**What is the average  
income** of mutual  
fund buyers,  
**by** region,  
**by** year?

## Data Mining & R

Knowledge discovery of  
hidden patterns

*“Insight & Prediction”*

**Who is likely to purchase  
a mutual fund** in the next  
6 months and why?

## Spatial

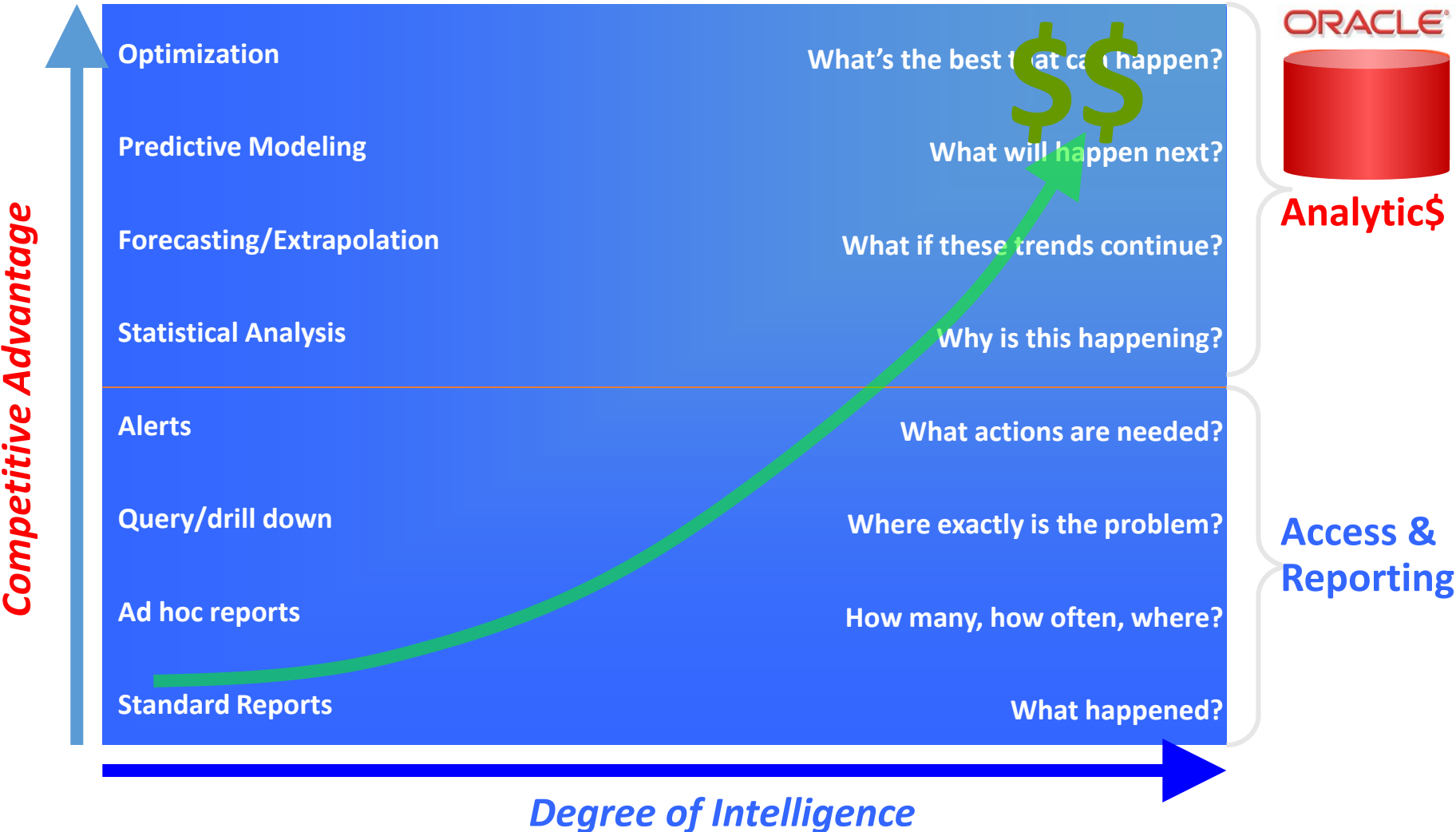
Spatial relationships  
between data

*“Location”*

**Where** were mutual  
funds purchased  
in the last 3 years?



# Competitive Advantage of BI & Analytics

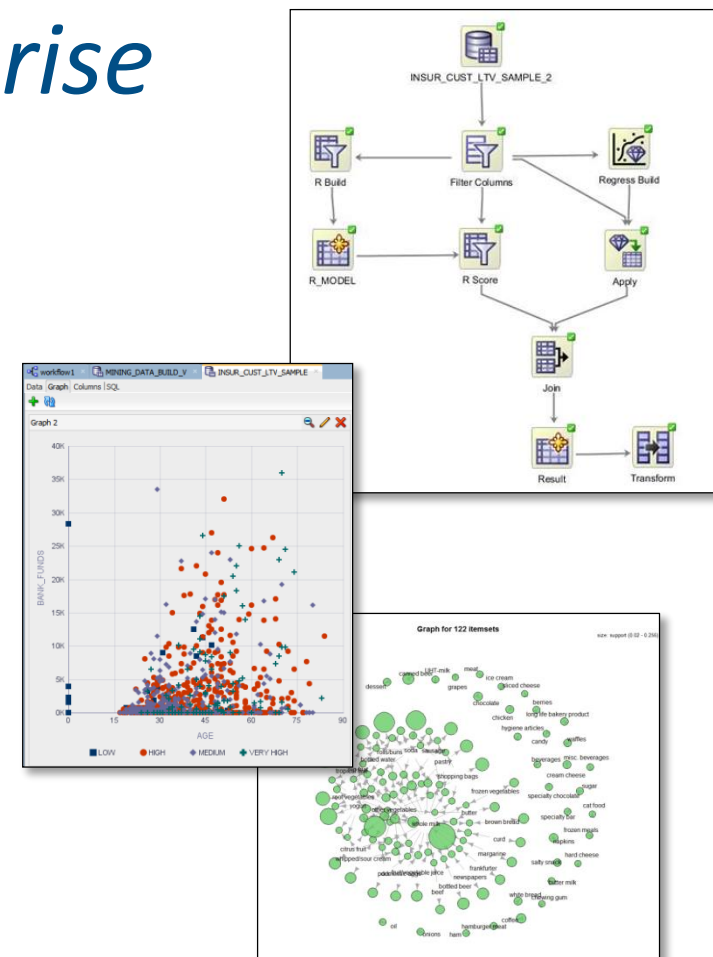




# Oracle Advanced Analytics (OAA) DB Option

## *Oracle Data Mining + Oracle R Enterprise*

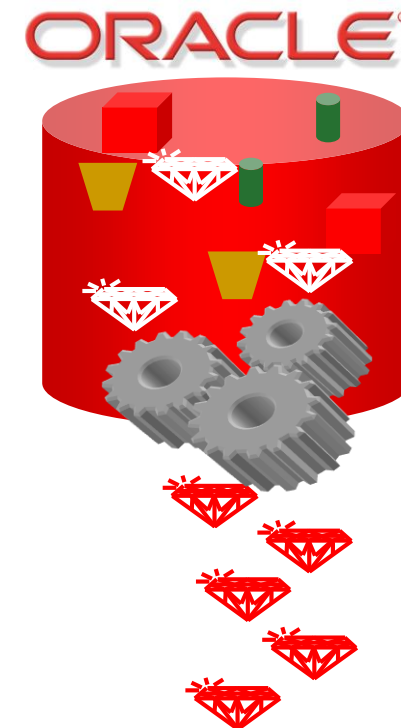
- Powerful **in-database** algorithms for **Data Mining** and **Statistical Analysis**
- **Easy** to add **predictive analytics** to enterprise applications and BI
- **Fastest** way to deliver **scalable, enterprise-wide** predictive analytics
- ORE eliminates R's limitations (memory and speed) for **Enterprise-scale analytics**





# What is Data Mining?

- Automatically sifts through data to find hidden patterns, discover new insights, and make predictions
- Data Mining can provide valuable results:
  - Predict customer behavior (*Classification*)
  - Predict or estimate a value (*Regression*)
  - Segment a population (*Clustering*)
  - Identify factors more associated with a business problem (*Attribute Importance*)
  - Find profiles of targeted people or items (*Decision Trees*)
  - Determine co-occurrences and “market baskets” within an event set (*Associations*)
  - Find fraudulent or “rare events” (*Anomaly Detection*)





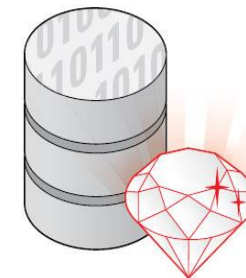
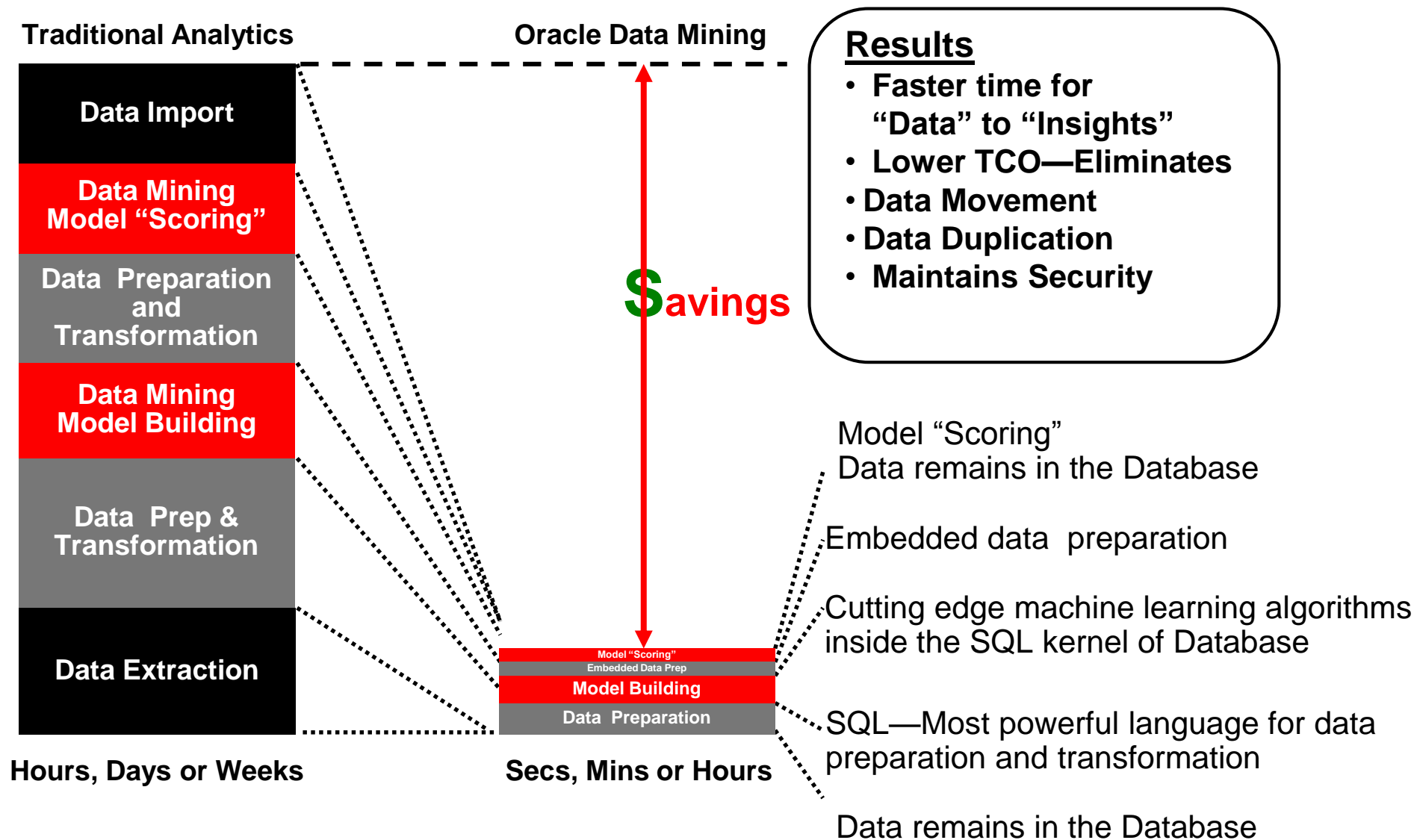


# Oracle Data Mining

- Oracle Data Mining is an option for the Enterprise Edition of the Oracle Database.
- A collection of APIs and specialized SQL functions.
- Includes a large number of specialized algorithms and built-in procedures.
- Makes use of many built-in capabilities of the Oracle Database
- ODM typically refers to “Oracle Data Mining”



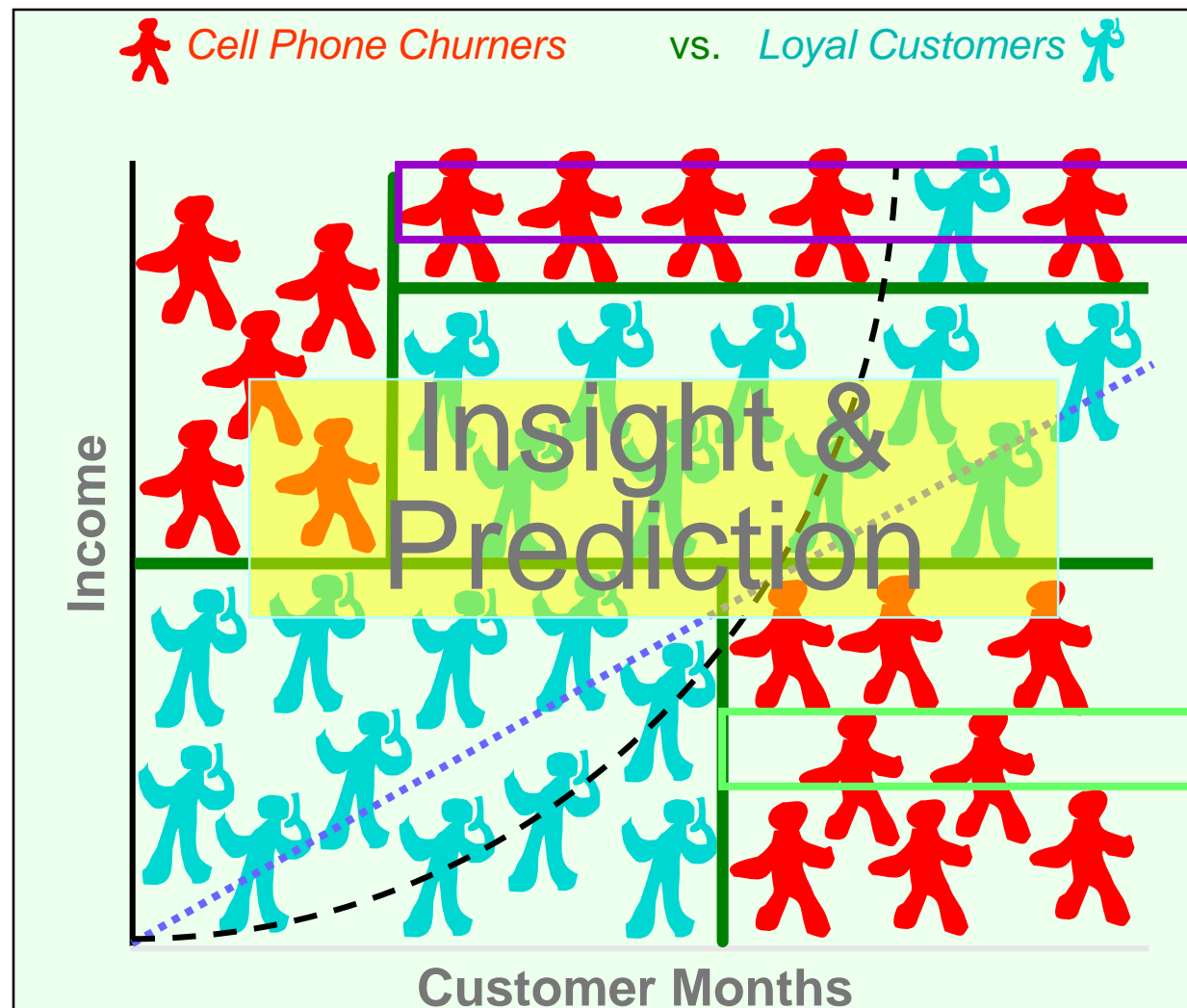
# In-Database Data Mining





# Data Mining Provides

*Better Information, Valuable Insights and Predictions*



Segment #3:

IF CUST\_MO > 7 AND INCOME < \$175K, THEN

Prediction = Cell Phone Churner

Confidence = 83%

Support = 6/39

Segment #1:

IF CUST\_MO > 14 AND INCOME < \$90K, THEN

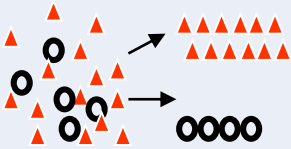

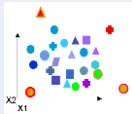
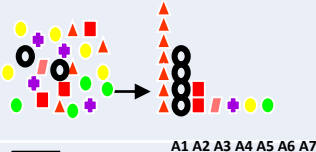
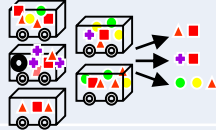
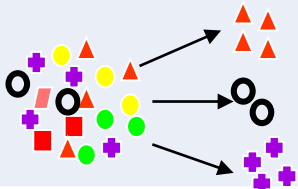

Prediction = Cell Phone Churner,

Confidence = 100%

Support = 8/39

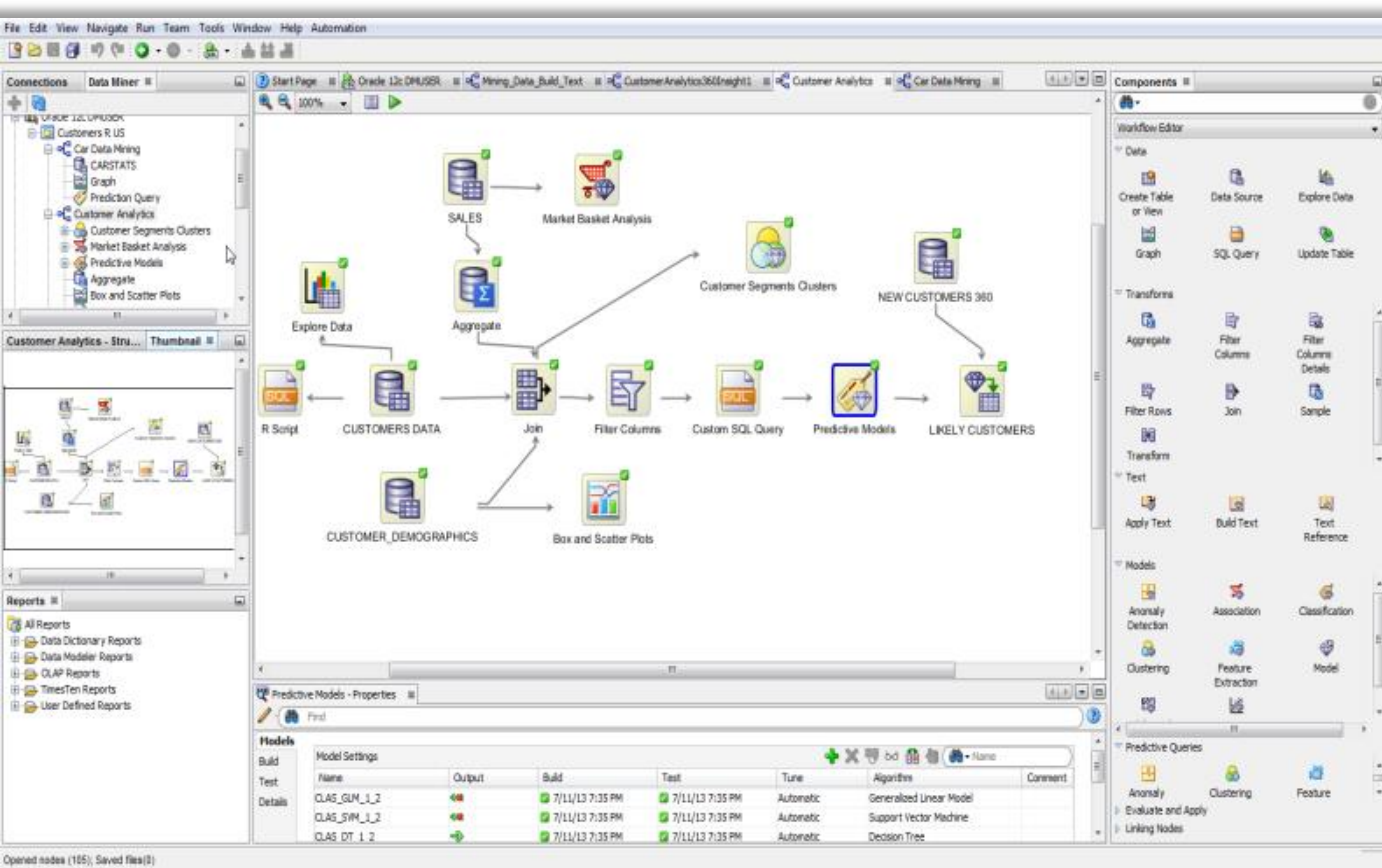


# Oracle Data Mining Algorithms

Problem	Algorithm	Applicability
Classification 	Logistic Regression (GLM) Decision Trees Naïve Bayes Support Vector Machine	Classical Statistical Technique Popular/Rules/Transparency Embedded app Wide/Narrow Data or Text
Regression 	Linear Regression (GLM) Support Vector Machine	Classical Statistical Technique Wide/Narrow Data or Text
Anomaly Detection 	One Class SMV	Unknown fraud cases or anomalies
Attribute Importance 	Minimum Description Length Principal Component Analysis	Attribute reduction Reduce data noise
Association Rules 	Apriori	Market Basket Analysis
Clustering 	Hierarchical K-Means Orthogonal Partitioning Expectation Maximization	Market Segmentation Product / Location Groupings Text analysis
Feature Extraction 	Non-negative Matrix Factorization Singular Value Decomposition	Feature Reduction Text Analysis



# Oracle Data Miner

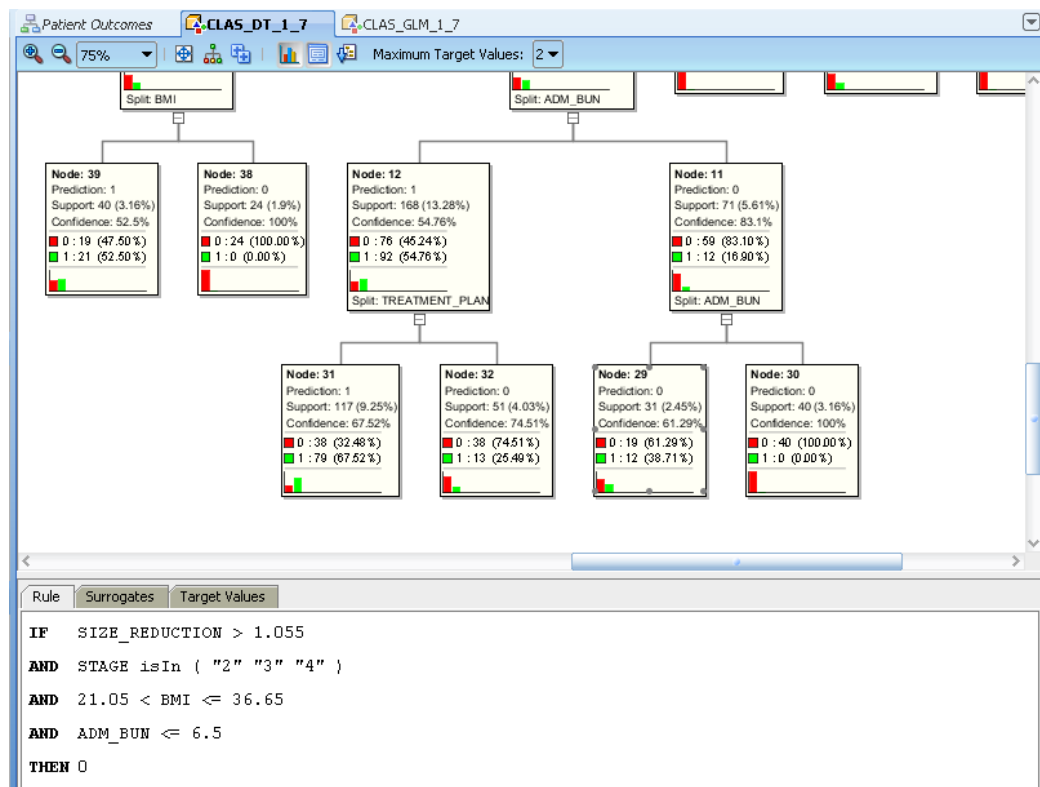


- Easy to Use
  - Oracle Data Miner GUI for data analysts
  - “Work flow” paradigm
- Powerful
  - Multiple algorithms & data transformations
  - Runs 100% in-DB
  - Build, evaluate and apply models
- Automate and Deploy
  - Save and share analytical workflows
  - Generate SQL scripts for deployment



# Understand Model Details

## ■ Interactive model viewers



Outcome predictive models

Target Value: 1

Sort by absolute value

Fetch Size: 10,000

Coefficients: 297 out of 297

Attribute	Value	Coefficient	Standardized Coeffi...	Exp(Coefficient)
<Intercept>	NULL	-1.83481346	0	6.26396556
TREATMENT_PLAN	Chemo_only	-0.46513283	0.11735002	1.59222567
WEEKDAY	W	-0.40697858	0.0869471	1.50227193
WEEKDAY	Th	-0.34941526	0.05883753	1.418238
RECURRENT	1	-0.33993936	0.07348783	1.4048624
STAGE	3	0.29916993	-0.06150948	0.74143341
FREQ_CHEMO	1	0.29378459	-0.06262496	0.74543705
FREQ_CHEMO	0	-0.26376819	0.05597178	1.30182638
IV_PAINMED	DEM	-0.26085980	0.036163	1.29804567
TREATMENT_PLAN	Chemo&Radiation	-0.25534174	0.03324906	1.2909027
TYPE_PROCD	closed	0.25466832	-0.01992872	0.77517356
PREOP_GI_MED	1	0.25194913	-0.06873117	0.77728428
MALIGNANCY	1	0.24061736	-0.05486614	0.78614238
QUARTER	A	0.23306129	-0.05746447	0.79210502
SIZE_REDUCTION	NULL	0.22915110	-0.15356344	0.79520837
TYPE_PROCD	1	-0.22759025	0.03846051	1.25557075
EPIDURAL	1	-0.22715954	0.05119796	1.25503009
INSURANCE	B	0.21168257	-0.05517357	0.80922152
OR_TRANSFUSIONS	1	0.20613024	-0.0550411	0.81372709
TYPE_ABX	Cipro	0.20248206	-0.02044382	0.81670114
EKG	SB	0.19228831	-0.02216336	0.82506896
IV_PAINMED	TORD	-0.19105185	0.01912802	1.21052222
INCISION	KNEE	-0.18882816	0.01878139	1.20783338
INSURANCE	C	0.18859100	-0.02710814	0.82812514
WT_LOSS_TIME	NULL	-0.17535293	0.11368976	1.19166672
WEEKDAY	Sa	0.17096336	-0.02674837	0.84285246





# Oracle Data Mining & OBI 11g

8.4 Oracle Datamining

LTV Prediction LTV Details **Classification Tree** LTV Probabilities What If Scoring

Classification Tree

Page Information (click to collapse or expand)

Classification Tree  
Time run: 12/9/2011 1:03:03 PM

20 Actual Unit Price

		2008	2009	2010	Grand Total
0 - All Individuals	MEDIUM	9.302	9.302	9.382	9.331
1 - M_MARITAL_ST in 'DIVORCED', 'SINGLE'	MEDIUM	9.207	9.329	9.421	9.322
2 - M_CRDT_RATE <= 657.5	LOW	9.225	9.164	9.377	9.261
12 - M_INCOME_LVL in 'LEVEL 5', 'LEVEL 6', 'LEVEL 7', 'LEVEL 8', 'LEVEL 9'	MEDIUM	8.904	9.131	9.670	9.261
13 - M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	LOW	9.345	9.176	9.259	9.261
3 - M_CRDT_RATE > 657.5	MEDIUM	9.193	9.462	9.454	9.370
14 - M_MONTHS_CONTACT <= 12.5	VERY HIGH	8.815	9.418	8.690	8.951
4 - M_MONTHS_CONTACT > 12.5	MEDIUM	9.242	9.468	9.543	9.421
7 - M_MARITAL_ST in 'MARRIED', 'WIDOW'	HIGH	9.397	9.276	9.343	9.341

1- Revenue

		2008	2009	2010	Grand Total
0 - All Individuals	MEDIUM	16,500,000	15,000,000	18,500,000	50,000,000
1 - M_MARITAL_ST in 'DIVORCED', 'SINGLE'	MEDIUM	8,155,247	7,589,505	9,289,014	25,033,766
2 - M_CRDT_RATE <= 657.5	LOW	3,560,875	3,340,550	4,015,646	10,917,071
12 - M_INCOME_LVL in 'LEVEL 5', 'LEVEL 6', 'LEVEL 7', 'LEVEL 8', 'LEVEL 9'	MEDIUM	938,983	889,059	1,189,016	3,017,058
13 - M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	LOW	2,621,892	2,451,491	2,826,630	7,900,013

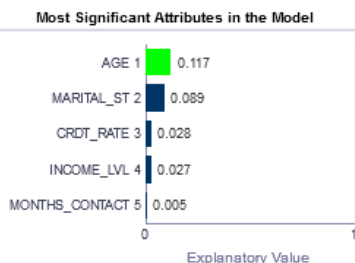
ODM's predictions & probabilities are available in the Database for reporting using Oracle BI EE and other tools

#	M23 Full Rule	Predicted LTV	# of Cust	1- Revenue	Trend
12	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE <= 657.5; AND M_INCOME_LVL in 'LEVEL 5', 'LEVEL 6', 'LEVEL 7', 'LEVEL 8', 'LEVEL 9'	MEDIUM	0		
13	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE <= 657.5; AND M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	LOW	0		
14	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE > 657.5; AND M_MONTHS_CONTACT <= 12.5	VERY HIGH	0		
15	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE > 657.5; AND M_MONTHS_CONTACT > 12.5	MEDIUM	0		
16	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE > 657.5; AND M_MONTHS_CONTACT > 12.5	LOW	0		
17	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_CRDT_RATE > 657.5; AND M_MONTHS_CONTACT > 12.5	MEDIUM	0		
18	M_MARITAL_ST in 'DIVORCED', 'SINGLE' ; AND M_MONTHS_CONTACT > 12.5; AND M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	HIGH	18	48,866	
19	M_MARITAL_ST in 'MARRIED', 'WIDOW' ; AND M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	MEDIUM	0		
20	M_MARITAL_ST in 'MARRIED', 'WIDOW' ; AND M_INCOME_LVL in 'LEVEL 1', 'LEVEL 2', 'LEVEL 3', 'LEVEL 4'	HIGH	0		



### Model Attributes Significance

Time run: 5/15/2014 7:37:48 AM



Select Table Details By Credit Rate

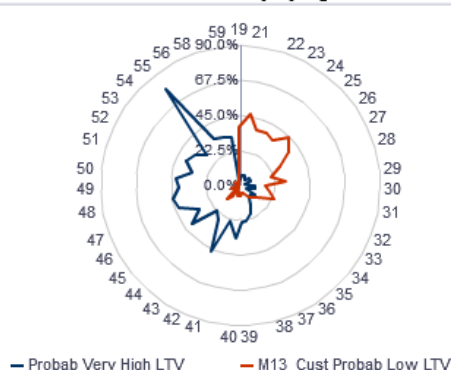
C6 Credit Rate	# of Custs	1- Revenue	Proba Low LTV	Probab Very High LTV
600	63	4,578,456	31.0%	11.0%
615	72	4,378,773	27.3%	8.0%
630	76	5,302,193	30.0%	7.6%
645	189	14,404,249	28.1%	9.7%
650	46	3,663,435	19.0%	12.9%
665	58	3,581,326	11.8%	15.3%
680	76	5,488,196	12.6%	14.3%
695	140	9,315,649	11.1%	22.7%
700	36	2,483,128	14.0%	23.9%
715	27	1,502,589	11.4%	33.1%
730	37	2,547,730	10.1%	28.3%
745	80	5,278,155	7.8%	21.7%
750	10	617,865	7.5%	11.5%
765	14	1,406,422	4.2%	39.6%



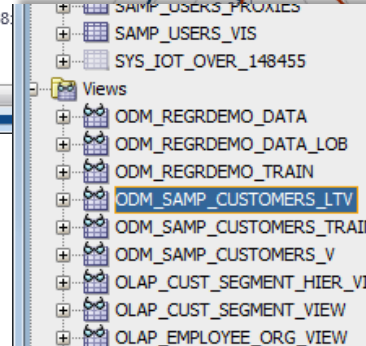
### Predicted LTV

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### LTV Probability by Ages



### LTV Probability by Income Level



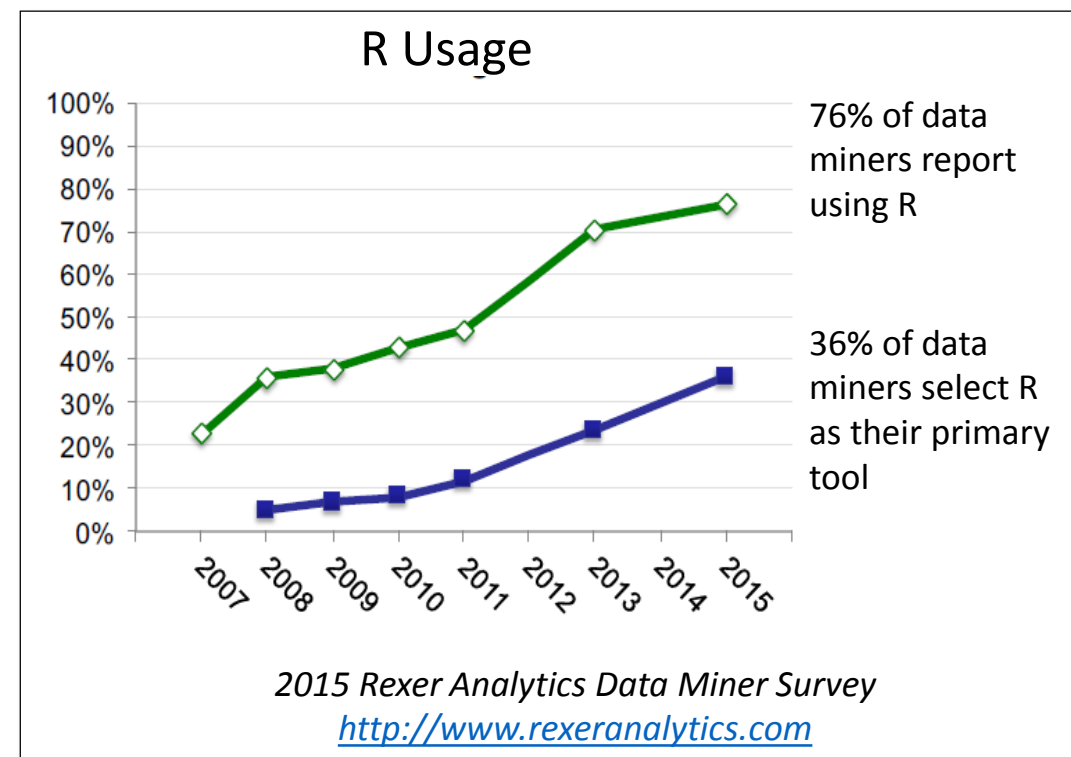
```
CREATE OR REPLACE FORCE VIEW "BISAMPLE"."ODM_SAMP_CUSTOMERS_LTV" ("CUST_KEY", "M_INCOME_LVL", "M_MARITAL",
SELECT C."CUST_KEY",
      C."M_INCOME_LVL",
      C."M_MARITAL_ST",
      C."M_CRDT_RATE",
      C."M_LTV",
      C."M_AGE",
      C."M_MONTHS_CONTACT",
      to_number(extractValue(PREDICTION_DETAILS(ODM_LTV_BIN USING *), 'Details/@node')) M_PRED_LTV_NODE,
      PREDICTION_PROBABILITY(ODM_LTV_BIN, 'VERY HIGH' USING *) M_PRED_PROB_VH,
      PREDICTION_PROBABILITY(ODM_LTV_BIN, 'HIGH' USING *) M_PRED_PROB_H,
      PREDICTION_PROBABILITY(ODM_LTV_BIN, 'MEDIUM' USING *) M_PRED_PROB_M,
      PREDICTION_PROBABILITY(ODM_LTV_BIN, 'LOW' USING *) M_PRED_PROB_L,
      PREDICTION(ODM_LTV_BIN USING *) M_PRED_BIN
FROM ODM_SAMP_CUSTOMERS V C;
```





# What is R?

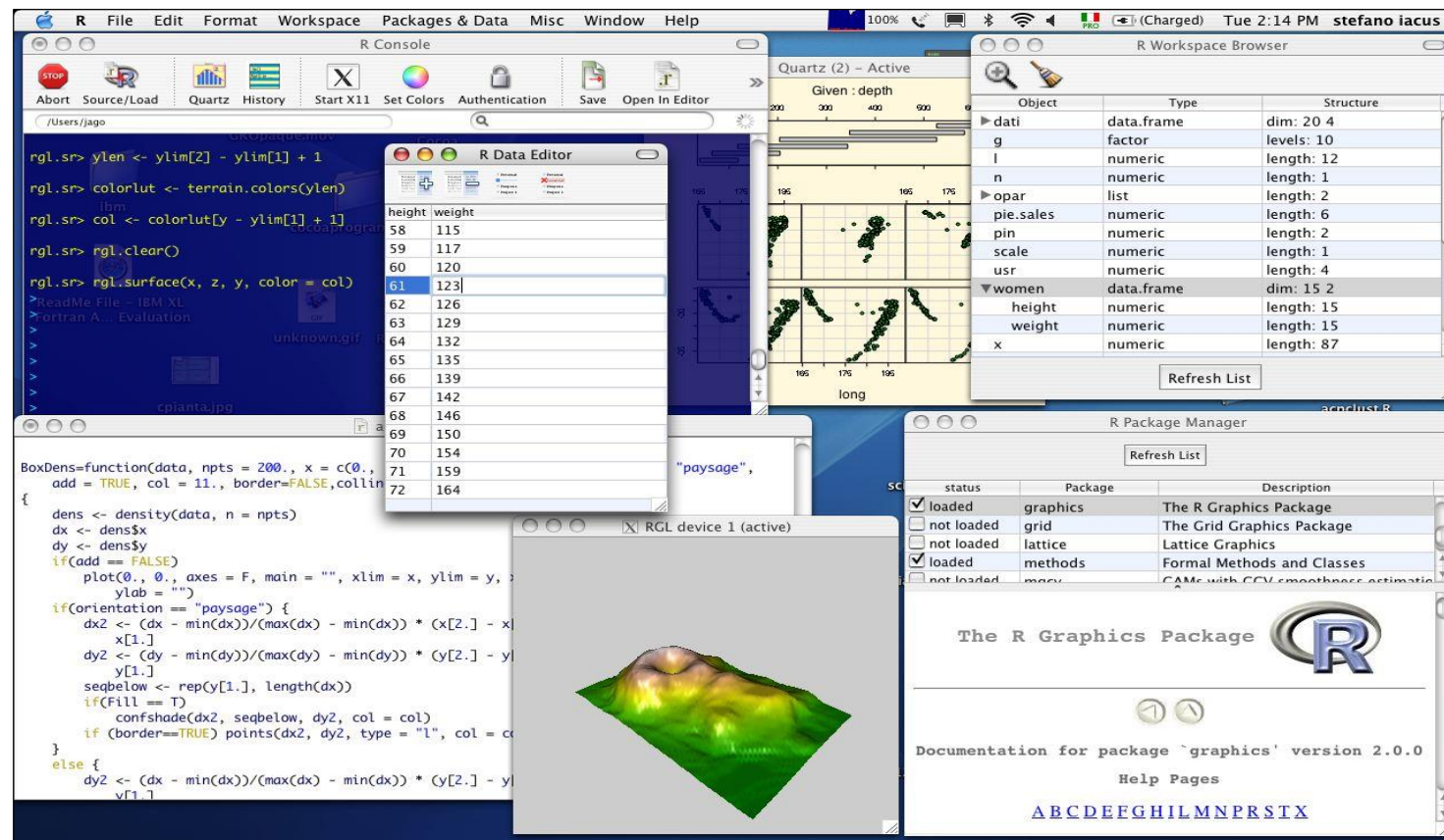
- An **Open Source** scripting language and environment for statistical computing and graphics  
<http://www.R-project.org/>
- Popular alternative to **SAS**, **SPSS** & other proprietary statistical environments
- 2 million+ users worldwide and growing
- Thousands of R packages available
- Taught extensively in higher education





# *R is extensively used by Statisticians, Data Analysts, Students*

- Free (Open source)
- Graphical
- Powerful
- Extensible
- Ease to install and use
- Industry/subject specific packages
- Out-of-the-box functionality with many 'knobs', but smart defaults



- Oracle R Distribution

- ROracle

*Open Source Software available to  
R Community for free*

- Oracle R Enterprise (ORE)

- Oracle R Advanced Analytics for Hadoop (ORAAH)

- Oracle R Connector for Hadoop (ORCH)



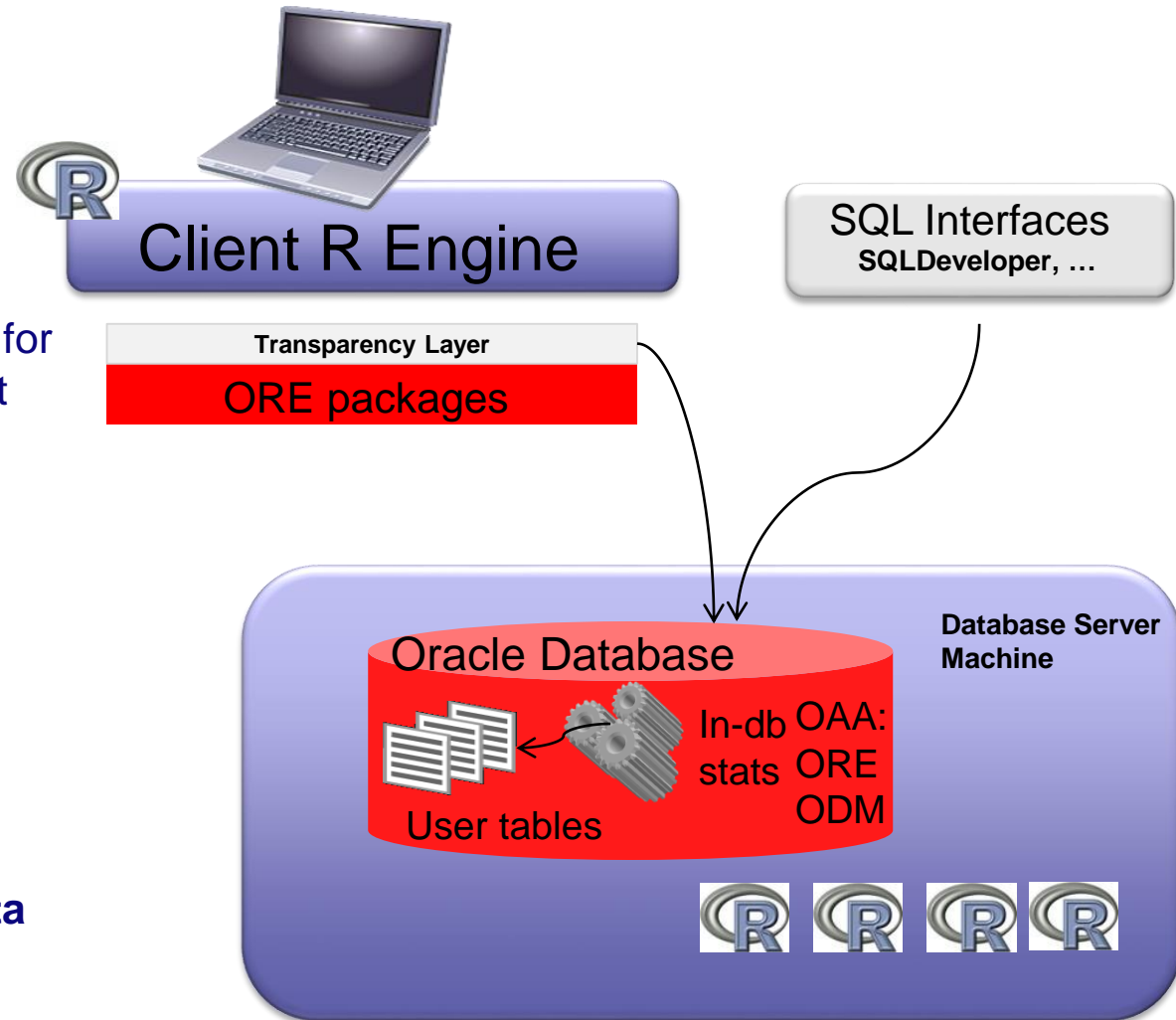
# Oracle R Enterprise

- Oracle R Enterprise (ORE) is a component of the Oracle Advanced Analytics (OAA) option to Oracle Database EE
- Provides transparent access to database-resident data from R
- Execute R scripts at the database machine managed by Oracle Database with data and task parallelism
- Execute R scripts from SQL
- Integrates R into the IT software stack
- Extends and enhances open source R



# Oracle R Enterprise

- A comprehensive, database-centric environment for end-to-end analytical processes in R, with immediate deployment to production environments
- Operationalize entire R scripts in production applications – eliminate porting R code
- Seamlessly leverage Oracle Database as an HPC environment for R scripts, providing data parallelism and resource management
- Avoid reinventing code to integrate R results into existing applications
- Transparently analyze and manipulate data in Oracle Database through R using versatile and customizable R functions
- Eliminate memory constraint of client R engine
- Score R models in Oracle Database
- Execute R scripts through Oracle Database server machine for scalability and performance
- **Get maximum value from your Oracle Database and Exadata**
- Enable integration and management through SQL
- Integrate R into the IT software stack, e.g. OBIEE





# R now integrated into OBIEE 11g and 12c

8.13 Oracle R Enterprise

Custom Link Home Catalog Favorites Dashboards New Open Signed In As Paulo Rodney

R Integration R End-User Interaction R Workbench R Sourcing from BI CEIM R Sourcing from BI CEIM (end-user) R Results Object in RPD BIP Sourcing from R Quality Control Chart (BIP)

Clear All Filters

Script Name

- Balloon Plot
- BusiestAirports-1
- Conditional Histogram
- Correlation Matrix Ellipses
- Correlation matrix circles
- Enhanced Bar Plot
- Heatmap
- Multipanel Geo Lattice Plot
- Multivariate Star Plot
- PredictDelays-build
- PredictDelays-score
- QCC-1**
- RandomRedDots
- Times Series Forecasting
- Volcano Perspective Plot
- Volcano Perspective Plot2
- syncFunction

Param 1: cursor(select q'ALL' UNIQUE\_CARRIERS,q'both' GRA

Param 2: cursor(select 550 "ore.png.height", 550 "ore.i

Apply

**QCC-1**

Edit Script

```
function(dat) {  
  uniquecarrier <- dat$UNIQUE_CARRIERS  
  delayType <- dat$DELAY_TYPE  
  startYear <- dat$START_YEAR  
  endYear <- dat$END_YEAR  
  newDataStartYear <- dat$NEW_DATA_START_YEAR  
  newDataEndYear <- dat$NEW_DATA_END_YEAR  
  graphTypes <- dat$GRAPH_TYPES  
  ore.sync(table="ONTIME_S")  
  ore.attach()  
  library("qcc", lib.loc="/home/oracle/R/library")  
  if(graphTypes == "both") graphTypes <- c("xbar", "S")  
  dat <- ONTIME_S  
  if(newDataStartYear != -1) {  
    dat <- dat[(dat$YEAR >= startYear & dat$YEAR <= endYear) |  
              (dat$YEAR >= newDataStartYear & dat$YEAR <= newDataEndYear),]  
  } else {  
    dat <- dat[dat$YEAR >= startYear & dat$YEAR <= endYear,]  
  }  
  if(uniquecarrier != "ALL") {  
    dat <- dat[dat$UNIQUECARRIER == uniquecarrier, ]  
  }  
  if (delayType=="arrival") {  
    dat <- dat[,c("ARRDELAY", "YEAR")]  
  } else {  
    dat <- dat[,c("DEPDELAY", "YEAR")]  
  }  
  names(dat) <- c("DELAY", "YEAR")  
  delayData <- ore.pull(dat)  
  library(qcc)  
  group <- qcc.groups(delayData$DELAY, delayData$YEAR)  
  numYears <- endYear - startYear + 1  
  par(mfrow=c(length(graphTypes), 1))  
  for(gt in graphTypes) {  
    if (newDataStartYear == -1) { # not using new data comparison  
      title <- paste(gt, "Chart for", delayType, "delay -",  
                    years, startYear, "-", endYear)  
      set1 <- group[1: numYears, 1]  
      obj <- qcc(set1, type=gt, title=title)  
    } else {  
      title <- paste(gt, "Chart for", delayType, "delay -",  
                    years, startYear, "-", endYear)  
      set1 <- group[1: numYears, 1]  
      set2 <- group[numYears + 1: length(group), 1]  
      obj <- qcc(set1, set2, type=gt, title=title)  
    }  
  }  
}
```

**QCC-1 Graphics Result**

**xbar Chart for arrival delay - years 1987 - 1999**  
new data 2000 - 2008

Calibration data in set1 New data in set2

Group summary statistics

UCL  
CL  
LCL

Number of groups = 22  
Center = 7.008499  
StdDev = 26.1959

LCL is variable  
UCL is variable

Number beyond limits = 16  
Number violating runs = 0

**S Chart for arrival delay - years 1987 - 1999**  
new data 2000 - 2008

Calibration data in set1 New data in set2

Group summary statistics

UCL  
CL  
LCL





# R now integrated into OBIEE 11g and 12c

R Workbench

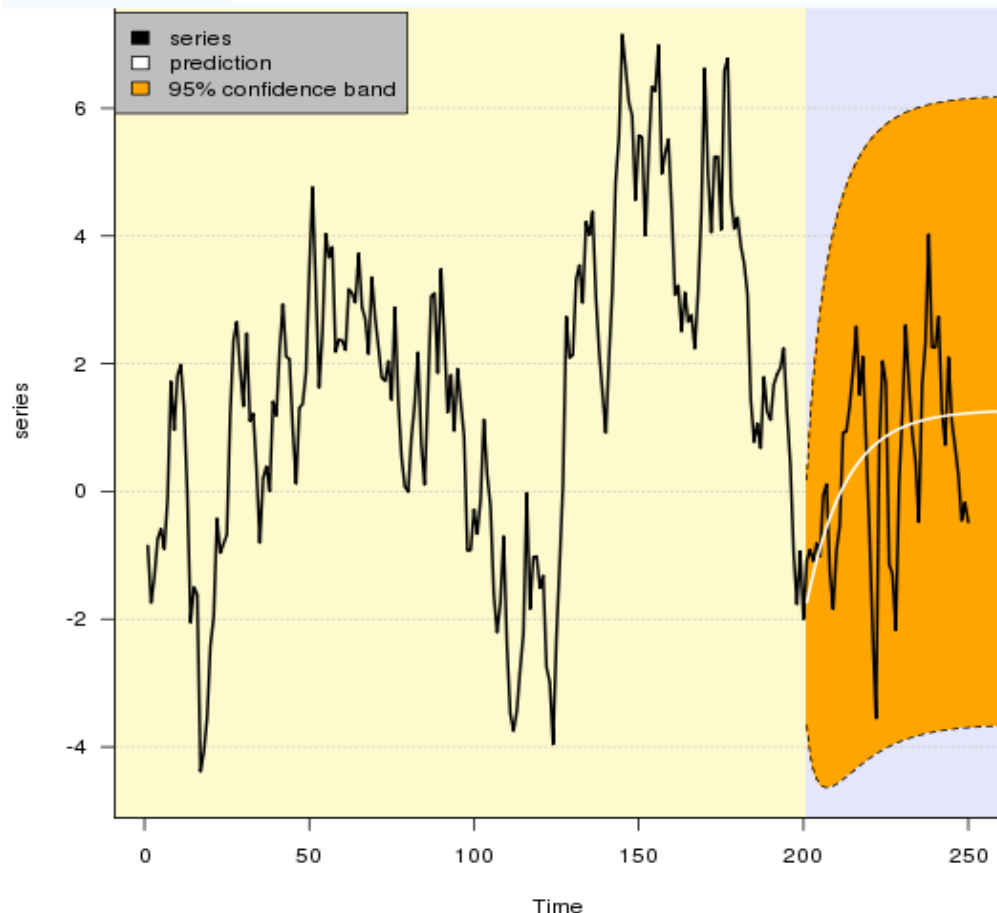
R Sourcing from BI CEIM

R Sourcing from BI CEIM (end-user)

R Results Object in RPD

BIP Sourcing from R

Quality Control Chart (BIP)



[Refresh](#)

```
require(gplots)

set.seed(120)
# simulate an AR(1) process
coefs <- 0.95
series <- arima.sim(list(ar=coefs),n=250)

# fit AR(1) with the 200 first data
model <- arima(series[1:200],c(1, # AR part
                                0, # I order
                                0)) # MA part

# make forecast from the model
forecast <- predict(model,80)

# compute the limits of the graph
ylim <- c( min(series[1:200],forecast$pred - 1.96 * forecast$se),
           max(series[1:200],forecast$pred + 1.96 * forecast$se))

# prepare the space where to plot
opar <- par(mar=c(4,4,2,2),las=1)
plot(series,ylim=ylim,type="n",xlim=c(1,250))
usr <- par("usr")

# split the figure in two parts
# - the part used to fit the model
rect(usr[1],usr[3],201,usr[4],border=NA,col="lemonchiffon")

# - the part used to make the forecast
rect(201,usr[3],usr[2],usr[4],border=NA,col="lavender")

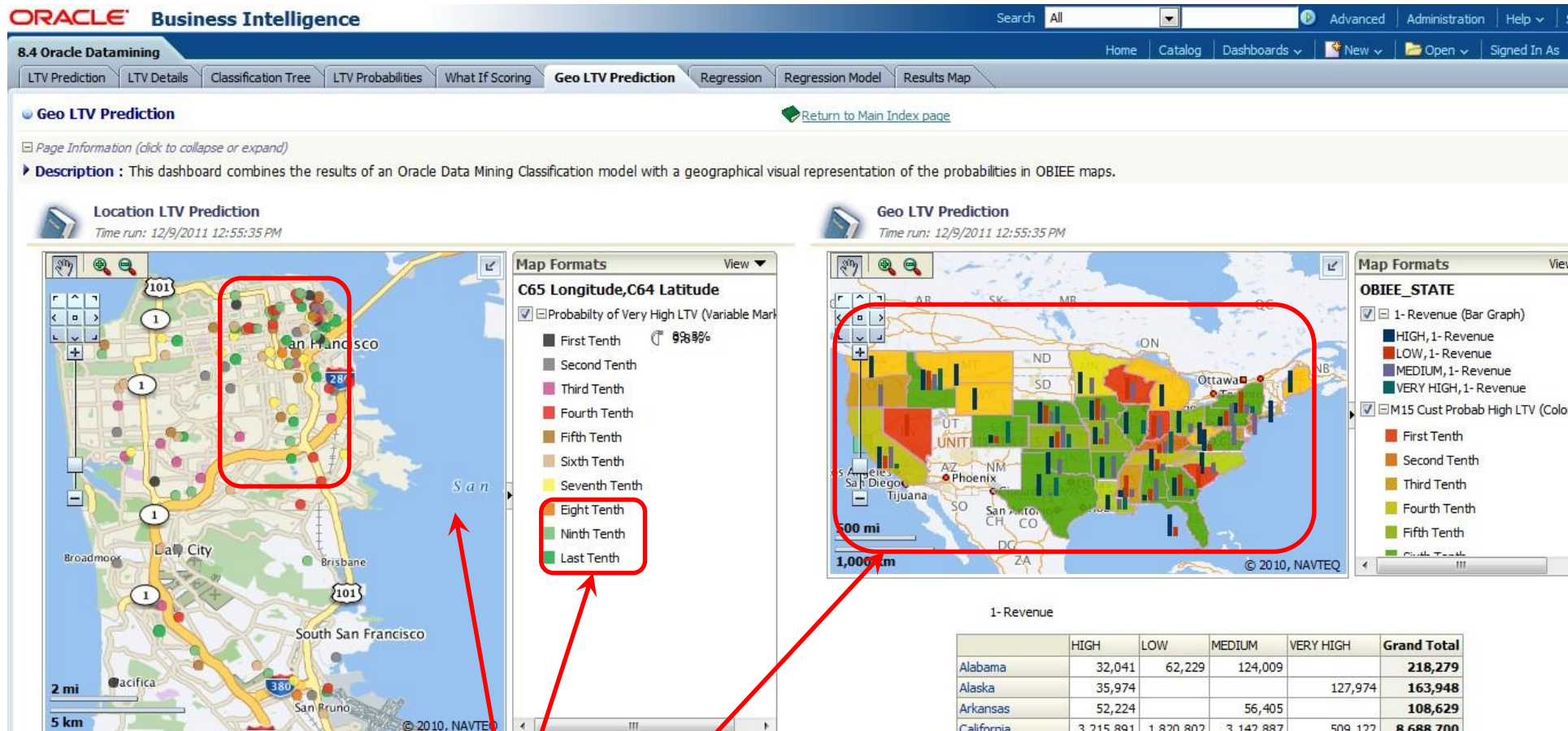
abline(h= (-3:3)*2, col="gray", lty=3)

# draw a 95% confidence band
polygon( c(201:280,280:201),
         c(forecast$pred - 1.96*forecast$se,rev(forecast$pred + 1.96*f
         col = "orange",
         lty=2,border=NA))

lines( 201:280, forecast$pred - 1.96*forecast$se, lty=2)
lines( 201:280, forecast$pred + 1.96*forecast$se, lty=2)
```



# Oracle Advanced Analytics & Spatial



Customer "most likely" be  
be HIGH and VERY HIGH  
value customer in the future





# 5 Common use cases for predictive analytics

- 1) Customer Segmentation using Clustering algorithms
  - Discovered patterns can be extremely meaningful
  - Able to include hundreds of dimensions
  - Great first project
- 2) Predict Lifetime Customer Value
  - Measure impact of different product purchases on LCV
  - Promote and incentive profitable purchases



# 5 Common use cases for predictive analytics

- 3) Market Basket Analysis for retailers and warehouses
  - Understand purchasing and picking patterns
- 4) Employee Retention analysis
  - Classify employees into basic categories
  - Understand impact of different incentives and rewards
- 5) Optimize Customer Service and Next Best Offer
  - Use decision trees to determine rules for customers
  - Dramatically increase effectiveness of offers



# Basic Ways to Get Started

- Do a POC project on your own
- Conduct a workshop for key stakeholders to build support
  - One hour to one day
  - Half-day works great
- Conduct ODM and ORE training classes with 1-day workshop
- Use a defined Quick Start program (2 weeks)



# ODM Quick Start Overview

- Hardware or Cloud
  - Oracle Database Appliance/Oracle Database Cloud Service
- Software
  - Oracle Database 12c (with options)
  - Oracle Advanced Analytics Option including Oracle Data Mining
  - Oracle SQL Developer: Data Miner Add-in (free download)
- Services
  - Implementation and configuration from VlamiS Software Solutions (Oracle Gold Partner)
  - Oracle University Oracle Data Mining Techniques course (taught by VlamiS Software Solutions)
  - Market Basket Analysis Project performed on company data
- Time frame: 9 business days (less than 2 weeks)



# Quick Start Compressed Schedule

- Day 1:
  - Two consultants meet with client team to review project plan, review data sources, identification of best data to start with, set technical objectives for project (basic market basket analysis deliverable)
- Day 2:
  - Consultant One: Install ODA and configure to network (need support from client tech staff)
  - Consultant Two: Conduct first day of ODM class with client team
- Day 3:
  - Consultant One: Install new pluggable Database, SQL Developer
  - Consultant Two: Conduct second day of ODM class with client team
- Day 4:
  - Two consultants establish data plan for project with client and import data
- Day 5:
  - Consultant One: Prepare tables for mining (add keys, new tables, transforms, etc.)
  - Consultant Two: Document data plan
- Day 6:
  - Consultant Two: Build market basket workflow
- Day 7:
  - Consultant Two: Conduct market basket analyses
- Day 8:
  - Consultant Two: Prepare presentation of findings from market basket analyses
- Day 9:
  - Consultant Two: Deliver presentation with client



# Important Factors in Getting Started

- Lots of internal experts and people who would like to be involved and learn
- Lots of people intimidated by what they don't know
- Start by “level setting” and establishing a strong foundation
  - Bring people along on the journey, establish culture
  - Everyone shares a minimum common knowledge base
- Use workshops (JAD style session) for investigation of possibilities
  - Evaluation of data sources and data sets
  - Recognition of major business issues
  - Review of basic algorithms
  - Identification of potential PoC projects (plusses and minuses)
- Decide on pilot projects and who works on it
- Start simple and return value quickly



# Oracle Data Mining Training (2 days)

- Introduction
- Data Mining Concepts and Terminology
- The Data Mining Process
- Introducing Oracle Data Miner 11g Release 2
- Using Classification Models
- Using Regression Models
- Using Clustering Models
- Performing Market Basket Analysis
- Performing Anomaly Detection
- Deploying Data Mining Results



# Oracle R Enterprise Training (2 days)

- Oracle R Enterprise technologies introduction
- Introduction to R hands-on
- ORE transparency layer with hands-on exercises
- ORE embedded R execution with hands-on exercises
- ORE predictive analytics with hands-on exercises
- Using ROracle
- Overview of ORE with OBIEE





# Comparison of Training Courses

## Oracle Data Mining

- Organized by algorithm
- Intro to data mining
- MBAs, BI Admin, DBAs
- Focused on business issues
- Uses GUI
- Approachable for new users

## Oracle R Enterprise

- Organized by process
- Intro to Oracle R Enterprise
- Data Scientists, BI Admin, DBAs
- Focused on executing R in Oracle Database
- Uses R scripts
- Technical



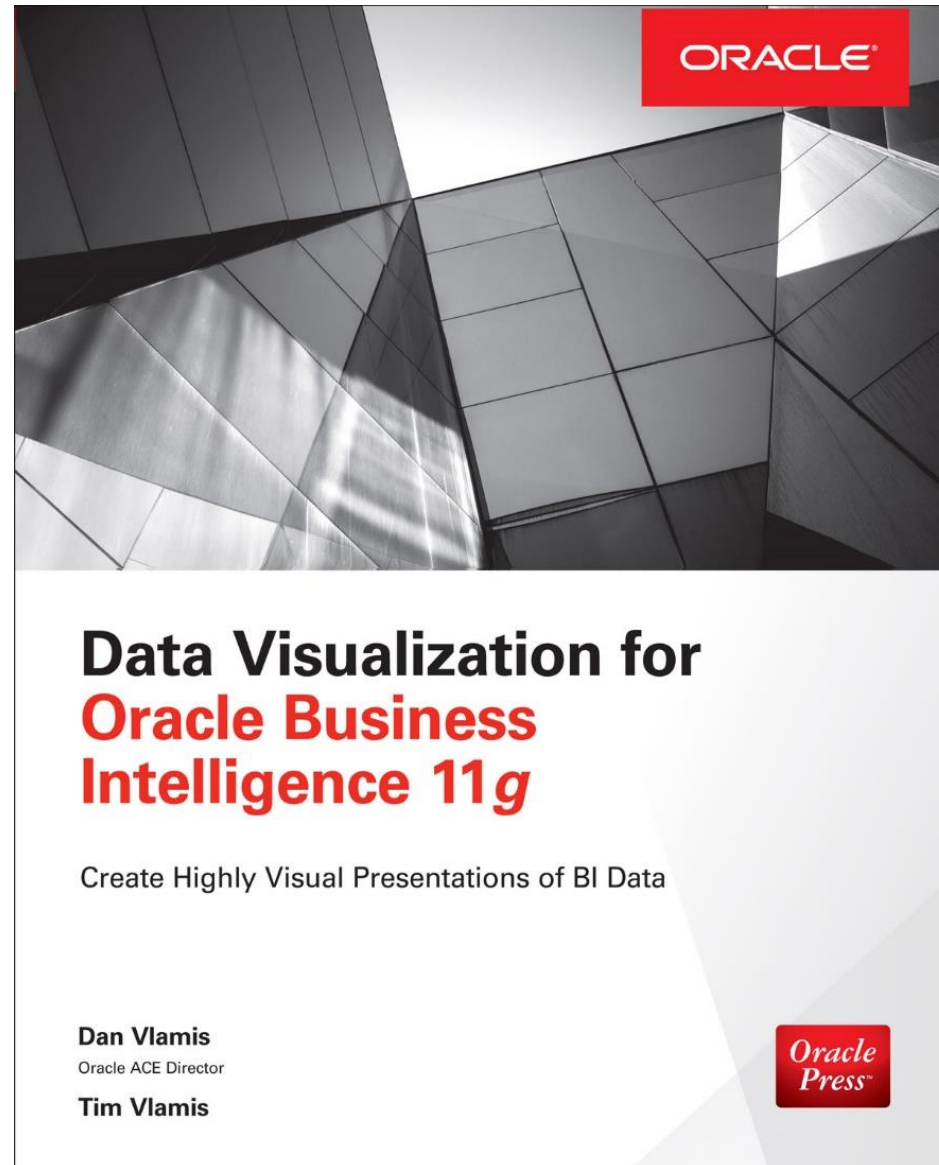
# Oracle Test Drive

- Free to try Oracle BI, Advanced Analytics Go to [www.vlamis.com/td](http://www.vlamis.com/td)
- Runs off of Oracle Cloud
- Test Drives for:
  - Oracle BI
  - Oracle Advanced Analytics
- Once sign up, you have private instance for one day
- Available now



# Drawing for Free Book

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# Thank You!

## Data Visualization for Oracle Business Intelligence

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